Maciej Kos

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Education

Northeastern University, Boston, MA — 05/2015 – present
Ph.D. Candidate in Computer Science / Personal Health Informatics (GPA: 4.0)

University of Michigan, Ann Arbor, MI — 12/2012
Master of Arts in Information Science

Barcelona Graduate School of Economics, Barcelona, Spain — 06/2009
Master of Science in Economics of Science and Innovation

University of Gdansk, Sopot, Poland — 06/2005
Bachelor and Master of Arts in Economics and E-business

Experience

Northeastern University — Boston, MA
Graduate Researcher — 09/2015 – present

"Measurement of collective physical distancing during the COVID-19 outbreak using large-scale mobility data" in collaboration with the MOBS lab, PI: Alessandro Vespignani

- Developed an approach for reducing selection bias in smartphone location data of over 40 million US users by combining well-established statistical techniques with multivariate simulations applied to geospatial socio-demographic data.
- Helped build a pipeline for processing of over 0.5 petabyte of data.

"Strengthening Human Adaptive Reasoning," in collaboration with Harvard and Oxford:

- Built a statistical model to characterize the relationship between different types of brain stimulation, participants' performance, and the estimates of their fluid intelligence.
- Helped develop a computational model of participants' performance during adaptive cognitive training.

"*WearTech:"*

- Used machine learning and signal processing techniques to develop a method for removing motion artifacts from heart rate data.
- Improved upon Microsoft's state-of-the-art algorithm.

Roku — Remote
Research Data Scientist Intern — 06/2021 – 09/2021

- Implemented and assessed methods for creating lookalike audiences using behavioral data (lift > 20x).
- Proposed novel algorithms for lookalike creation.

Google — San Francisco, CA
Quantitative UX Research Intern (with Material Design) — 05/2019 – 09/2019

- Developed an algorithm for computing the website's cognitive complexity based on Shannon's entropy.
- Prototyped an analytics pipeline to parse 400 billion pages and fuse Google's diverse signals about each website (e.g., vertical, location, reach).

Philips Healthcare Research — Cambridge, MA
Research Intern (with Clinical Data Analytics) — 05/2018 – 09/2018

- Proposed and prototyped system architectures and UX of two clinical decision support systems for preventing delirium and critical illness brain injury.
- Submitted two patent applications to the legal department.

Polish National Science Center, Research Grant — Poland & Boston, MA
Investigator / Research Group Manager — 07/2013 – 05/2018

- Conceptualized a study of genetic health information avoidance, wrote Research Strategy of a winning grant application ($77,000; the largest grant awarded to researchers at the economics department).
- Wrote software for running online experiments, managed online and offline experiments with > 1000 participants.
- Analyzed data and presented findings at four conferences.

Agile Axons (self-employed) — Poland and Rome, Italy
User Experience and Research Consultant — 01/2013 – 08/2015

- Led a UX team developing a consumer-facing mobile app for a large Italian telco (with **McKinsey** and **Ericsson**).
- Consulted on research design and statistical programming for behavioral finance and economics projects.

Earlier positions include:

- Graduate Research Assistant at the University of Michigan,
- Localization tester at Electronic Arts in Spain,
- IT content editor at Softonic in Spain,
- Product Manager (intern) at Internet Advantage in Spain.
- Researcher/Lecturer at the University of Gdansk (Poland)

Selected Awards

- NIH National Institute of Aging: Transition to Aging Research F99/K00 Fellowship (pre- and post-doc), 2020 – 2026 (46,000 – 56,000 USD annually for tuition and stipend)
- Association for Computing Machinery HPC/Intel Corporation Computational and Data Sciences Fellowship, 2017 – 2020 (15,000 USD annually until 2020)
- Google Scholarship, 2020 (10,000 USD)
- Computing Research Association URMD Grad Cohort Workshop, 2020 – travel award
- Grace Hopper Conference, 2019 – Google travel award
- Complex Physical, Biological & Social Systems Winter School at New England Complex Systems Institute, MIT, Cambridge, MA, 2019 – tuition waiver
- Disability:IN, 2017 - NextGen Leader award
- 4th Annual Political Networks Conference and Workshops at the University of Michigan, 2011 – fellowship
- Barcelona Graduate School of Economics, 2008/2009 – merit-based full tuition waiver (12,000 EUR)

Grants

- Network Science Institute Seed Grant Program, 2021 (10,000 USD) – grant for exploratory research on "App Networks Analysis for Developing a Digital Biomarker of Cognitive Health"
- Northeastern University, Tier 1 Grant (50,000 USD), 2020 – Seed Grant/Proof of Concept grant for high risk, high reward research project "Towards a digital biomarker of cognitive health - unobtrusive and continuous" with co-PIs Sumientra Rampersad and Misha Pavel
- Northeastern University, 2020 (3,000 USD) – dissertation grant
- Polish National Science Center, 2013 (77,000 USD) – research grant to study why individuals often avoid actionable genetic health risk information; I wrote the Research Strategy for the application that won the largest grant awarded to researchers at the economics department before enrolling into my Ph.D. program
- Erasmus Life-long Learning Grant, 2008 (1,900 EUR)
- University of Gdansk, 2007 (2,000 USD) – research grant to characterize usability of academic websites
- Erasmus Socrates Mobility Grant, 2005 (1,850 EUR)

Mentorship

Northeastern University (2019):

- Guided three graduate students through completing their data science capstone project
- Mentored a graduate student in health data analytics

University of Gdansk (2006 – 2009):

- Mentored two teams of graduate students participating in Google Online Marketing Challenge; one of the teams won the first place in Poland
- Advised 20 undergraduate students on their theses projects

Selected Teaching Experience

- Northeastern University:
  - Teaching assistant: Health Data Analytics (HDA6400), graduate course
- University of Gdansk:
  - Instructor: Web usability, undergraduate and graduate course
  - Instructor: Internet Marketing and online communities, graduate course

Academic Service

- Ad hoc reviewer for:
  - SIG Computer-Human Interaction,
  - IEEE Engineering in Medicine and Biology Society
  - American Medical Informatics Association
- Northeastern Personal Health Informatics Faculty Committee, 2018/2019 – elected student representative
- Personal Health Informatics seminar, 2016/2018 – organizer (with C. Gordon and S. Ólafsson)
- Northeastern University Ph.D. task force, 2016 – representative of the Personal Health Informatics program
- Interdisciplinary Committee on Organizational Studies 9th Biannual Dissertation Poster Session at University of Michigan Ross Business School, 2011 – coordination team member
- Rackham's International Connect, 2010/2011 – mentor
- Poland Foresight 2020 national research program – external expert

- Barcelona Graduate School of Economics, 2008/2009 – student representative
- E-business Science Association, 2006-2008 – chair at the University of Gdansk
- Baltic Science Festival, 2007/2008 – departmental coordination team member

Professional Associations

- Association for Computing Machinery
- IEEE
- American Medical Informatics Association
- Society for Affective Science
- Society for Judgment and Decision Making
- Anita Borg Institute for Women in Technology
- Disability:IN

Side Projects (pro-bono volunteering)

- The Lives of the Dissidents: helped launch a charity project dedicated to spreading the message of peaceful dissent as a means of dissolving oppression; designed information architecture, conducted usability studies and card sorting sessions
- Child Aid: analyzed data and consulted on the research design of a large-scale experimental intervention to increase the literacy of Guatemalan children

Publications (peer-reviewed)

- Pavel M., Caves K., Jarvis L., Hasson C.J., **Kos M.**, Jimison H. (2021). *Unobtrusive, Continuous LIDAR-Based Measurement of Gait Characteristics at Home*. Paper presentation at the 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Virtual
- **Kos M.**, Pavel M., Jimison H., Saczynski J. (2020). *Sensitivity of dual-task motor performance to varying levels of cognitive impairment: a systematic review and quality assessment* (paper under review)
- Khaghani-Far, I., Li, X., **Kos, M.**, Gordon, C. M., Williams, H., Pavel, M., & Jimison, H. B. (2019). NUCoach: *A Customizable Coaching Platform for Designing Rehabilitation Mobile Apps*. Archives of Physical Medicine and Rehabilitation, 100(7), e2.
- **Kos M.**, Li X., Khaghani-Far I., Gordon C., Pavel M., Jimison H. (2017). *Can accelerometry data improve estimates of heart rate variability from wrist PPG sensors?* Paper presentation at the 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, South Korea.
- Blajer-Golebiewska, A. and **Kos, M.** (2016). *Investors are more sensitive to information about financial rather than ethical reputation of a company: evidence from an experimental study*. Economics & Sociology, 9(1), p.11.
- **Kos M.** (2013*). Structural and behavioral determinants of play in a repeated network coordination game – preliminary report*. Contemporary Economy Economic Scientific Journal, 3(4), 43-69.
- **Kos, M.** (2010). *Business aspects of user-centric design*. In J. Winiarski (Ed.), E-commerce. University of Gdansk Print House.
- **Kos, M.** (2008). *Cultural factors in online marketing communications through corporate websites*. In J. Winiarski, K. Dobrowolski, O. Dębicka, T. Gutowski, & A. Oniszczuk (Eds.), Enterprise on a global market. University of Gdansk Print House.
- **Kos, M.** (2007). *Virtual communities as a new channel in Internet marketing communications*. In Dobrowolski K. and Kujawa J. (Eds.), Electronic Business. University of Gdansk Print House.

Conference Presentations (peer-reviewed)

- **Kos M.**, Pavel M., Jimison H. (2019). *How to Validate Heart Rate Monitoring Wearables for Just-in-Time Adaptive Health Interventions? Development of Comparison Testing Guidelines.* Poster presentation at the Annual American Medical Informatics Association Symposium, Washington, DC.
- **Kos M.**, Ponnada A., Pavel M., Intille S. (2018). *Evidence That Microinteraction Ecological Momentary Assessment (μEMA) is a Non-Reactive In-Situ Affect Assessment Method*. Poster presentation at the 2019 Society for Affective Science Annual Conference in Boston, MA.
- Rampersad S., Orhan K., **Kos M.**, Mansfield K., Marghi Y. M., Sheffield J., Dillard M., Erdogmus D., Pascual-Leone A., Yeung N., Mathan S., Cohen K. R., Pavel M. (2018*). Effects of EEG-Based Closed-Loop Transcranial Alternating Current Stimulation on Theta Power during a Cognitive Task*. Poster presentation at the 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Hawaii.
- **Kos M.**, Gordon C., Li X., Khaghani-Far I., Pavel M., Jimison H. (2017). *The Accuracy of Monitoring Stress from Wearable Devices*. Poster presentation at the Annual American Medical Informatics Association Symposium, Washington, DC.

Conferences and Workshops (not peer-reviewed)

- Klein B., LaRock R., McCabe S., Torres L., Friedland L., **Kos M.**, Privitera F., Lake B., Kraemer M., Brownstein J.S., Lazer D., Eliassi-Rad T., Scarpino S.V., Vespignani A., Chinazzi M. (2020). *Reshaping a nation: Mobility, commuting, and contact patterns during COVID-19.* Presentation at COVID-19 Satellite of Sunbelt XL, International Sunbelt Social Network Conference, virtual
- **Kos M.** (2020). *Towards a digital biomarker of cognitive health: passive monitoring of cognitive changes using smartphone-based data*. Poster presentation at the Computing Research Association Grad Cohort Workshop, Austin, TX.
- **Kos M.**, Yew J. (2019). *Computational methods for understanding cognitive density preferences; foundations for adaptive user experiences*, Google Ph.D. Intern Research Conference, Mountain View, CA.
- McKanna J., **Kos M**., Plessow F., Dillard M., Almquist J., Kimball G., Myers E., Orhan U., Rampersad S., Marghi Y., Cornhill D., Brem A., Mansfield K., Yeung N., Thompson T., Santarnecchi E, Erdogmus E., Pascual-Leone A., Kadosh C. R., Mathan S., Pavel M. (2017). *Components of cognition: identifying contributors to learning speed in a game training intervention*. Poster presentation at xTech, San Francisco, CA.
- **Kos M.**, McKanna J., Pavel M., Dillard M., Almquist J., Kimball G., Brem A., Orhan U., Rampersad S., Cornhill D., Yeung N., Erdogmus D., Pascual-Leone A., Kadosh R., Mathan S. (2017). *The impact of stimulus features on learning and accuracy in an adaptive category learning task designed to train fluid intelligence*, Poster presentation at the Association for Psychological Science annual convention, Boston, MA.
- **Kos M.**, Blajer-Gołębiewska A., Wach D., Pavel M., Gonzalez R. (2016). *Decision-making under threat: what determines our engagement in preventive behaviors?* Poster presentation at the Society for Judgment and Decision-Making annual conference, Boston, MA.
- **Kos M.**, Blajer A., Wach D. (2015). *When do we avoid health-risk information?* Poster presentation at the Society for Judgment and Decision-Making annual conference, Chicago, IL.
- **Kos M.**, Blajer A., Wach D. (2015). *Identifying predictors of preventive behaviors using a financially incentivized experiment – a pilot study*. Poster presentation at the 37th Annual North American Meeting of Society for Medical Decision Making, St. Louis, MO.
- Blajer A., Wach D., **Kos M.** (2015). *When inducing affective decision-making statistical significance may be not enough*, Oral presentation at the 10th Nordic Conference on Behavioral and Experimental Economics, Tampere, Finland.
- **Kos M.**, Blajer A., Wach D. (2015). *When do individuals avoid potentially life-saving risk information?* Poster presentation at the Subjective Probability, Utility, Decision Making conference, Budapest, Hungary.

Book chapters (not peer-reviewed)

- Jimison H, **Kos M.**, Pavel M., *Early Detection of Cognitive Decline via Mobile and Home Sensors*. In Personal Health Informatics: Reimagining Consumer Health Informatics for Precision Medicine and Healthcare. Springer, Cham. (in press)